4 RESPONSES TO COMMENTS

4.1 RESPONSE TO COMMENTS FROM DOCUMENT 1: LETTER DATED FEBRUARY 10, 1999, FROM TRI-VALLEY CARES

Comment Code 1-1
Response:

DOE disagrees that a new EIS/EIR is needed because LLNL, since 1992, has "continued to have environmental concerns." DOE's evaluation of the environmental impacts of LLNL operations, considering changes since 1992 and new projects or proposals to be implemented by 2002, indicates they would remain within the envelope of environmental consequences established in the 1992 EIS/EIR. The SA concludes that either the projected impacts are within the bounds of the 1992 EIS/EIR analysis, or that the incremental differences are not significant. See the responses to comments below and also Common Issue 2.1, Supplement Analysis Process, above, for further discussion.

Comment Code 1-2
Response:

DOE disagrees that a new EIS/EIR is needed because both the Livermore Site and Site 300 are on the National Priorities List. The Livermore Site and Site 300 were placed on the NPL in 1987 and 1990, respectively, primarily as a result of trichloroethylene contamination in the groundwater. A discussion of the level of contamination was presented in the 1992 EIS/EIR (section 4.17), as were the proposed remediation program and the status of the review and approval of the appropriate Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) documentation.

For a discussion of the NEPA process, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 1-3
Response:

DOE agrees it has exceeded National Pollutant Discharge Elimination System permit values at LLNL 14 times since January 1996, with two of those exceedances resulting in Notices of Violation (NOV); no fines were assessed. In response to the releases that occurred in 1996-1997, LLNL increased its employee awareness and source control efforts. These have been effective. The last release to the sanitary sewer that exceeded LLNL's permit limits occurred in December 1997. In September 1998, LLNL completed the installation of its upstream triggers pH-monitoring station. In the past, pH releases outside of permit conditions were detected and diverted to the Sewer Diversion Facility by the Building 196 monitoring station. Building 196 generally took about two minutes after initial detection to confirm that a release was occurring

and activate this diversion. Thus, the first few hundred gallons of a release were not captured. This new station remedies that situation. It is located upstream of Building 196 and is configured to detect and divert a pH release to the Sewer Diversion Facility before any of the release can leave the site.

Comment Code 1-4

Response:

DOE disagrees that LLNL has a history of recent, frequent accidents. The Laboratory has implemented programs, policies, and procedures to manage industrial and nuclear safety. In the event of an occurrence, the Laboratory or DOE investigates the incident, determines the root-cause, develops corrective actions, monitors their implementation, and disseminates lessons learned to ensure the recurrence of similar incidents is prevented.

As an example, in January of 1997, a gas sensor detected the presence of chlorine gas in a cabinet containing a pressurized cylinder of chlorine. The sensor automatically sounded an alarm and shut off the flow of chlorine from the cylinder. No detectable gas concentration reached the inhabited portions of the building, although the building was evacuated for 15 minutes in response to the alarm. The cause of the leak was a defective commercial chlorine gas pressure regulator that had just been placed into use in the gas cabinet. The defective part was immediately fixed. Several elements of the LLNL defense-in-depth program were displayed here. An alarm notified personnel to evacuate until the level of concern could be identified. The automatic shutoff system worked and prevented further release. The location of the gas cabinet in the building gas vault prevented general release of the gas at a detectable concentration. This incident yielded no detectable chlorine concentrations within the inhabited portions of the building and was within the bounds of potential impacts from an accidental 100-pound release of chlorine gas presented in the 1992 EIS/EIR.

Another example is the July, 1997 “shredder accidental exposure” in which workers shredding used air filters were radioactively contaminated. One worker was contaminated with curium, an alpha emitter, on his chest, face, and in his nostrils. A DOE report credited inadequate safety procedures for this accident. This incident was investigated by DOE. The report, “Type B Accident Investigation Board Report of July 2, 1997 Curium Intake By Shredder Operator At Building 513 Lawrence Livermore Laboratory,” dated August 1997, was the result of a detailed investigation into the events that led to the exposure. The investigation resulted in several corrective actions called Judgments of Need (JON). The JONs were designed to eliminate any future accidents of this nature. LLNL’s corrective action plan, which consisted of 47 separate actions, was accepted by DOE Oakland Operations Office (DOE/OAK) and a Headquarters DOE Price Anderson Amendment Act audit panel. LLNL has demonstrated to DOE, through an assessment of its corrective action implementation, that it has met the requirements of the JONs.

Comment Code 1-5

Response:

DOE acknowledges that in a facility with a large number of employees and operations, such as LLNL, it is possible to operate with an occasional employee failing to observe a procedure, such as inattention, miscommunication, or lack of discipline. However, DOE and LLNL take these failures seriously, recognizing that one reason for following a procedure is to prevent accidents and to protect the worker and the public. Every failure that crosses a reporting threshold is reported to laboratory management, to the DOE site/area office, and to DOE Headquarters through the formal "Occurrence Reporting and Processing System." Each report includes a root cause analysis and a corrective action to prevent it or similar recurrences. Lessons learned that could be of value elsewhere are distributed throughout DOE contractors. DOE program managers also trend these occurrence reports, and when a pattern or specific process or facility appears to be having a generic problem, formal action is taken by DOE management. Accidents that exceed certain thresholds are formally investigated by formal Accident Investigation Boards. Incidents that violate Nuclear Safety Requirements (e.g., 10 CFR 830 and 10 CFR 835, and their implementation plans) are investigated by an independent office in DOE Headquarters, and if that incident reflects a pattern or carelessness, formal enforcement actions are pursued under 10 CFR 820, which may result in fines and even imprisonment, and have resulted in fines at this laboratory. The commentor has identified two notable examples (the curium accident and the infractions in Building 332) for which DOE has launched formal investigations and enforcement actions, even extending to mentoring programs to improve the safety culture in Building 332.

When the July 1997 criticality infractions occurred in Building 332, the Laboratory management took an immediate action to place the facility into "STANDBY MODE." This decision was made without influence of the DNFSB. These criticality infractions were related to the fact that workers failed to follow approved procedures containing criticality controls. The infractions were self-reported by the facility workers and, most importantly, no radioactive materials were released and no worker contamination occurred. Furthermore, the Criticality Safety Group conducted thorough evaluations of both infractions and concluded that neither infraction, even if not identified, would have led to any criticality events, even under the most conservative of assumptions.

Work in the Plutonium Facility has been restricted since July 1997. During this time, the safety processes and procedures used in the Plutonium Facility have been extensively modified, workers re-certified, and work conducted to assess the viability of these changes. DOE and LLNL believe these changes have corrected the fundamental causes leading to the criticality infractions. In the course of the resumption process, DOE HQ, DOE/OAK, and the DNFSB have been exercising close oversight roles in enhancing Building 332's safety culture.

Comment Code 1-6

Response:

DOE disagrees that LLNL has a history of "receiving Notices of Deficiency (NOD) and NOVs from the California Department of Toxic Substances Control (DTSC)." DOE believes that

LLNL operates safe, environmentally sound, and regulatory compliant waste management facilities for all its hazardous and mixed waste activities. Specifically, there were no violations with significant impacts to human health or the environment during the 1991 through 1994 annual DTSC inspections of LLNL. All violations during this period were corrected in a timely manner. No violations of the regulations were found during the 1995 and 1996 inspections. During the 1997 inspection, DTSC cited LLNL for handling "combined waste." Combined wastes are radioactive wastes that contain California-only hazardous constituents. The citations stemmed from a disagreement between DTSC and DOE over regulatory status and DTSC's jurisdictional authority over the waste streams; the citations did not stem from unsafe handling of the wastes and did not pose a threat to human health or the environment. These waste streams are being handled as LLW under the requirements of the DOE. The DTSC and the DOE are in discussions regarding the regulatory status of these wastes and are in the process of negotiating a Memorandum of Agreement. LLNL was also inspected in 1998; however, the report of that inspection has not yet been finalized.

As part of LLNL Resource Conservation and Recovery Act (RCRA) Part B permit application, on March 1997, DTSC issued a NOD. The NOD are DTSC's comments and questions to clarify and complete the information in the LLNL application and are not considered violations of regulations. This is a routine part of the review of a Part B application by DTSC for any facility and is not specific to the LLNL Part B application.

Comment Code 1-7

Response:

DOE agrees that there is still contamination of the groundwater at LLNL. However, significant improvements have been made over the last few years. In 1997 LLNL found hazardous levels of mercury in soils cleaned out of a single stretch of storm drain. That soil was removed as hazardous waste and the storm drain lined. Following this activity, LLNL detected mercury downstream of this location in a single storm water sample. This was the first detection of mercury in LLNL storm water runoff since 1994. Mercury has not been detected in subsequent samples.

The groundwater tritium plume at Site 300 extends about 9,500 ft from its sources at landfill Pits 3 and 5 and the Building 850 firing table. No part of the plume extends offsite and no human receptors are threatened. Maximum current groundwater tritium activities are about 475,000 pCi/L. The majority of the plume is in a laterally extensive perched water-bearing zone. Radioactive decay reduces the activity of tritium by one half every 12.3 years. Time-series plots of total tritium in groundwater have generally shown a decline in total tritium activity with time, resulting from both radioactive decay and dispersion. Until recently, the total tritium activity in the plume has generally decreased at a rate similar to or greater than the radioactive decay rate. Despite occasional slug releases from the landfills, the horizontal extent of the Pits 3 and 5 portion of the tritium plume has not increased during the 1986-98 time period, thus supporting that natural attenuation by radioactive decay and dispersion is occurring. From 1985-98, the horizontal extent of the Building 850 portion of the tritium plume has increased only along its distal edges; the extent of the 20,000 pCi/L contour (which is the State and Federal Maximum Contaminant

Level) has markedly retreated. Using conservative assumptions and hydraulic parameters, fate and transport modeling indicates that when the tritium plume reaches the northern Site 300 boundary, the tritium activities will be at background levels (100 pCi/L). Modeling indicates that tritium activities at the southern Site 300 boundary will also be low, around 1,000 pCi/L. There are no contaminant transport pathways to humans on or offsite, and thus there is no risk to humans. The issue of tritium in Site 300 groundwater in the Pits 3 and 5 areas, and at Building 850 Firing area, was discussed extensively in both the 1992 EIS/EIR (Section 4 and Volume IV). This issue has also been discussed in the Site Annual Environmental Reports.

To address the rise and fall of groundwater levels at Site 300, LLNL had installed, by April 1992, an interceptor trench system upgradient of the west firing area landfills at Site 300. The trench was constructed as part of the RCRA capping of landfill pit 7. The purpose of the interceptor trench system was to intercept shallow subsurface groundwater flow and divert it away from landfill pit 7. This trench has reduced the amount of water available to get into the pit. In addition, by the summer of 1999, LLNL will sample and calculate the inventory of tritium in landfill pits 3 and 5. Computer modeling of the tritium values will be conducted to determine if this source of tritium contamination to the groundwater could potentially present a risk to human health and the environment. Should such a potential risk be identified, then source isolation technologies would be implemented to prevent risk to human health and environment from tritium.

Comment Code 1-8

Response:

DOE believes it has managed sewer system problems at LLNL in a responsible and proactive manner. During the period of 1992-1995, LLNL investigated over 22,000 source connections (including approximately 7000 drains) and their respective destinations. Approximately 150 of these sources required some form of repair. These repairs were complete at the end of 1995. During the same interval approximately 24,000 linear feet of sewer line was relined using an in-situ form liner to endure the integrity of the sewer system. LLNL's source control effort has proven effective. There has not been a discharge from the sanitary sewer that exceeded permit conditions since December 1997.

After signing the CERCLA ROD in 1992, new innovative technologies have been employed to accelerate cleanup in a more cost-effective manner. LLNL has implemented a strategy called Engineered Plume Collapse (EPC). EPC utilizes the appropriate technologies needed to cost-effectively achieve the required remedial objectives and increase contaminant mass removal. Mass removal rates at the Livermore Site have more than tripled since the implementation of EPC in 1997. An additional example is that rather than constructing seven permanent groundwater treatment facilities as outlined in the CERCLA ROD, LLNL has developed alternative treatment units to accomplish site cleanup. Currently, LLNL is operating 4 permanent groundwater treatment facilities, 2 vapor extraction facilities, 10 portable treatment units, 1 mini treatment unit, 1 in-situ catalytic reductive dehalogenation unit, and 1 solar powered groundwater treatment unit.

Rather than extracting groundwater from 18 initial locations, LLNL currently treats groundwater from 60 extraction wells at 16 locations in 11 separate areas, treating approximately 725,000 gallons of groundwater per day or about 22 million gallons per month. Most groundwater treatment is accomplished by air stripping, with some ion exchange where needed. Remediation of the one area at the site that contained fuel hydrocarbons was completed in 1995 and resulted in a determination of No Further Action by the regulatory agencies in 1996. Hydraulic collapse of the western offsite contaminant plumes has been dramatic, resulting in pull-back of one plume by more than 1000 feet and a decrease in volatile organic compound (VOC) concentrations by an order of magnitude. Currently, VOC concentrations offsite are generally below 50 parts per billion (ppb) and are approaching the Maximum Contaminant Level of 5 ppb. The affected groundwater is not used by the public, and therefore the risk to the public is minimal.

See also the response to comments 1-2, 1-3, and 1-7, above.

Comment Code 1-9

Response:

DOE disagrees that "LLNL has a history of being out of compliance with safe storage requirements." DOE and LLNL conduct all waste management activities in compliance with the applicable regulations. All hazardous and mixed waste are managed in accordance with the California Code of Regulations Title 22 and CFR Title 40. In addition, the treatment and storage facilities used for regulated wastes will comply with a RCRA permit that will incorporate an approved operations plan.

DOE and the State DTSC have entered into an agreement dealing with mixed waste, pursuant to the Federal Facilities Compliance Act of 1992. This agreement has resulted in a Site Treatment Plan that addresses all mixed waste streams, describes the treatment process planned for them, and gives dates for completion of treatment. Regular reports are required and have been provided by LLNL. DOE believes DTSC has a thorough understanding of how LLNL manages its mixed wastes, combines waste, and manages issues regarding cross-contamination through inspections and the permitting process.

In 1998, LLNL provided DTSC with a list of Satellite Accumulation Areas. LLNL has never refused accessibility of inspectors to areas within the laboratory or within buildings that house Satellite Accumulation Areas.

DTSC is aware of how LLNL treats its hazardous and mixed waste. The regulated waste operations during "interim status" are outlined in the interim status documents. Interim status documents for hazardous and mixed waste operations at LLNL include the approved August 1996 (revised January 1997) Part A and the interim status document dated May 16, 1983. Currently, LLNL hazardous and mixed waste operations are annually inspected by the DTSC against the hazardous waste regulations and the interim status documents. LLNL does not employ waste treatment and handling activities other than the ones authorized by the DTSC. LLNL has also explained in detail its future hazardous and mixed waste operations in the Part A and Part B

permit application. The permit application has been reviewed by the DTSC and has been deemed complete. LLNL is required to label mixed waste as such. The labels for mixed waste include the words “Hazardous and radioactive mixed waste”.

In 1990, there were questions concerning one shipment of waste to the Nevada Test Site (NTS). Once the waste reached NTS, the generator belatedly informed Hazardous Waste Management (HWM) that there might have been some Kimwipes (paper tissues) which may have been used in conjunction with solvents to degrease radioactive components. LLNL suspected the waste was mixed waste. LLNL representatives went to NTS and were able to verify, through the paperwork, that 12 of the containers did not contain the Kimwipes but that 18 may have contained Kimwipes. The containers could not be opened at NTS without the proper facilities; therefore, the containers were returned to LLNL for additional characterization.

Comment Code 1-10
Response:

DOE acknowledges that there have been problems with the use of HEPA filters at LLNL. However, DOE and LLNL disagree with the comment that the nuclear safety program and the safety of the public have been compromised by LLNL operations. As safety concerns are identified, corrective actions are developed and implemented in a timely manner. As an example, the Facility is in the process of replacing aging HEPA filters, starting with systems relied on to provide confinement of nuclear materials. The Facility expects to be complete with the replacement of the confinement HEPA filters by the end of fiscal year 1999.

See also, Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 1-11
Response:

DOE does not believe that there are “significant new circumstances or information relevant to environmental concerns… since the 1992 EIS/EIR for LLNL, thus requiring a new EIS/EIR.” Operations at Building 332 are included in the analysis of the 1992 EIS/EIR.

See Common Issue 2.1, Supplement Analysis Process, Common Issue 2.2, Proposed Changes in Administrative Limits, and Common Issue 2.4, Concern with HEPA Filters, above. See also the response to comments 1-1 and 1-5, above.

Comment Code 1-12
Response:

DOE agrees that plutonium has been found in Big Trees Park at concentrations above those that can be attributed to worldwide fallout, but DOE disagrees the plutonium came from an airborne pathway or is related to the HEPA filtration issues for Building 332. After finding a sample with 1.02 pCi/g in 1995, the laboratory has taken a large number of samples in 1998 to

determine the degree of and extent of the plutonium levels, and to determine the source. The data establish that the elevated plutonium is generally confined to the southeast corner of the park, and is not found outside the park or above background levels at the adjacent school. Because of the nature of atmospheric dispersion, it is not possible that such a very limited distribution could have resulted from an airborne pathway, such as from a building release or re-suspension of contaminated soil by wind or human activity. The deposition pattern from an airborne pathway would most likely be cigar- or fan-shaped, with increasing concentrations extending back nearly to its source.

The laboratory considered whether there might have been an aquatic pathway. The park contains a filled, former channel of Arroyo Seco, which in the past received runoff water from LLNL. However, sampling along that channel between LLNL and the park, as well as within the park to the depth of the former channel, did not detect plutonium above 0.043 pCi/gm, which is near the upper range of fallout background.

The soil samples with plutonium above fallout levels are nearly all within the treewells and in the immediate proximity of ornamental trees planted in the 1970s. These soil samples also had higher level of metals. The laboratory believes that the plutonium must have come to the park in sewage sludge used as an amendment or mulch during and/or after planting of the trees. The City of Livermore treats sanitary sewage from the laboratory. The levels and locations of the plutonium and its association with metals strongly suggests that past releases of plutonium to the sewer about 1967 may have become mixed with the sludge at the Livermore Water Reclamation Plant.

The 1998 samples were collected under the observation of state and federal regulatory agencies, and about 10% of the samples were separately analyzed by three different certified analytical laboratories, with good agreement. The highest concentrations found in the 1998 sampling was 0.774 pCi/g, which is less than a third of the EPA residential screening level of 2.5 pCi/g, at which further assessments of health risk are suggested. The data can be found on the web at http://www-erd.llnl.gov/bigtrees/, and will be included in the 1998 SAER.

The EPA, California Department of Health Services, DTSC, and the Agency for Toxic Substances and Disease Registry all agree that the levels do not present a health hazard and that cleanup is not warranted. In view of the comprehensiveness of the sampling program and the low levels observed, no further sampling expeditions are planned.

Comment Code 1-13

Response:

DOE disagrees that the proposed change in plutonium and uranium limits pose a significant increase in the operational impacts at LLNL. These changes are mostly in the allowable quantities of storage and not in the material at risk.

See Common Issue 2.2, Proposed Changes in Administrative Limits.

Comment Code 1-14
Response:

DOE is still committed to reducing the total amount of plutonium at LLNL to 200 kg when feasible. This issue was addressed in the 1992 EIS/EIR. However, DOE is still analyzing the issue of surplus plutonium disposition throughout the DOE complex.

See also the response to comment 1-13, above.

Comment Code 1-15
Response:

DOE disagrees that the proposed changes in uranium limits require the preparation of a new EIS/EIR. The need for enriched uranium (greater than 1% U-235) derives primarily from projected near-term projects involving the Dual Revalidation Program, a portion of the Fissile Materials Disposition (Immobilization) Program, and the Advanced Recovery Integrated Extraction System (ARIES) R&D work (a total of approximately 200 kg). Most of this need occurs in Fiscal Years 1999 and 2000 and most of this material will not remain at LLNL, but will be shipped to other DOE facilities prior to Fiscal Year 2002. The Dual Revalidation Program will assess the status of the LLNL and LANL stockpiled weapons. The Immobilization Program will evaluate the option for long-term disposition of surplus plutonium to immobilize it in either glass or ceramic for disposal in a geologic repository or for long-term safe storage. The ARIES project will recover plutonium from old weapons; the LLNL work will focus on pit disassembly and converting plutonium into an oxide form for disposition.

A portion of the need for additional natural or depleted uranium (less than 1% U-235) stems mainly from the Fissile Materials Disposition (Immobilization) related R&D projects which will involve approximately 700 kg of natural or depleted uranium, most of which will be shipped to other DOE facilities by Fiscal Year 2003 as the R&D progresses.

The additional portion of the need for natural or depleted uranium would derive from Mixed Oxide (MOX) Lead Test Assembly work currently being considered for implementation at LLNL in the Draft Surplus Plutonium Disposition EIS. As in the other projects, natural or depleted uranium would be brought in for the work, but would also be shipped out as work is incrementally completed, so that only an additional approximately 1000 kg would remain onsite after Fiscal Year 2003. The MOX Lead Test Assembly project at LLNL will fabricate nuclear fuel rods for nuclear power plants by using surplus weapon plutonium (PuO_2) and vendor supplied (UO_2); this process will convert surplus plutonium for peaceful applications.

As discussed in Section 6 of the SA, administrative limits are established to administratively control maximum quantities of radioactive materials in Buildings 332 and 334.

These limits reflect program needs. Postulated accident analyses associated with radioactive materials are documented in the 1992 EIS/EIR (including this SA) and the SAR for each facility.

For Buildings 332 and 334, LLNL proposes to increase the current administrative limit for uranium from 300 kg (depleted, natural, and enriched) to 500 kg of enriched uranium and 3,000 kg of natural and depleted uranium. It is known that natural and depleted uranium do not pose significant hazards as compared to enriched uranium. There is considerable natural uranium in the LLNL region; the significant consideration is the increase in the administrative limit from 300 kg to 500 kg, since the majority of current inventory in Building 332 is enriched uranium. In addition, hazards resulting from a proposed Building 332 administrative limit of 3,000 kg of uranium with less than 1% enrichment of U-235 would be bounded by that from the Building 493 administrative limits for natural and depleted uranium of 80,000 kg (Table 4.15-1 of the 1992 EIS/EIR).

The proposal to increase the administrative limit for uranium does not change the restriction on the maximum material at risk imposed on workstation or glovebox operations. As an example, the quantity of fissile material, including uranium, will still be limited to 20 kg in each of laboratory rooms with the exception of the vaults. Only the amounts in storage will be increased, not the working inventories.

Comment Code 1-16

Response:

The "Green Book" is the program plan that describes DOE's strategy to ensure high confidence in the safety and reliability of the nuclear weapons stockpile. As part of the weapons complex, LLNL continues to have a role in the stockpile stewardship program, confirmed in the ROD for the Stockpile Stewardship and Management Programmatic EIS (SSM PEIS). While DOE is charged with maintaining the *capability* for research and development of nuclear weapons, the Department of Defense has no requirements for new nuclear weapons and DOE is not developing new weapons.

Comment Code 1-17

Response:

The SA is correct in stating that the increased administrative limits for uranium are partly required to support the research and demonstration work for the MOX fuel project. This is part of DOE's program for disposition of surplus plutonium as a result of the downsizing of the nuclear weapons stockpile. Also, the R&D-related work on the projects cited above is considered within the scope of operations and potential impacts of ongoing programs at LLNL encompassed by the 1992 EIS with the exception of the Lead Test Assembly work, which is an alternative that is being considered by DOE for assignment to LLNL through the vehicle of a DOE Programmatic EIS currently in process. If LLNL is selected to perform this activity, an appropriate project-specific NEPA review will be conducted.

The increased administrative limit for uranium in Buildings 332 and 334 is not to support the Atomic Vapor Laser Isotope Separation (AVLIS) follow-on program.

Comment Code 1-18

Response:

DOE does not agree that there is "a plethora of new and/or significantly changed programs at LLNL since 1992." DOE considers NIF, AVLIS Integrated Process Demonstration (IPD) follow-on activities, subcritical nuclear tests, and the Advanced Design and Production Technology (ADAPT) work at LLNL to be projects that represent variations of existing programs at LLNL. AVLIS is a technology which can selectively separate the isotopes of uranium to enrich the product stream in U-235, thus generating a product that is commercially valuable for fabrication of fuel for nuclear power reactors; the IPD at LLNL is intended to support the confirmation of technical performance and validation of economic projections. The ADAPT Program is a DOE-wide effort to develop technologies for new processes and practices to enable cost-effective production of stockpile weapon components; the enduring stockpile, as well as workforce skills, will be maintained by a combination of repairs, refurbishments, and as needed replacements. Where there was a need for more project-specific impact analysis, it was provided.

Comment Code 1-19

Response:

DOE disagrees that "a new or, at a minimum, a supplemental EIS is required" due to "clearly significant new circumstances or information relevant to environmental concerns." DOE's evaluation of the environmental impacts of LLNL operations, considering changes since 1992 and new projects or proposals to be implemented by 2002, indicate they would remain within the envelope of impacts established in the 1992 EIS/EIR.

See also the response to comments 1-1 and 1-2, above. Also, see Common Issue 2.1, Supplement Analysis Process, and Common Issue 2.2, Proposed Changes in Administrative Limits.

4.2 RESPONSE TO COMMENTS FROM DOCUMENT 2: LETTER DATED FEBRUARY 25, 1999, FROM U.S. ENRICHMENT CORPORATION (USEC)

Comment Code 2-1
Response:
Comment acknowledged.

Comment Code 2-2
Response:
Comment noted. Changes were incorporated as suggested by the commentor.

4.3 RESPONSES TO COMMENTS FROM DOCUMENT 3: PUBLIC BRIEFING, LIVERMORE, FEBRUARY 11, 1999, 2:00 P.M.

Comment Code 3-1
Response:
See the response to comment 1-1, above.

Comment Code 3-2
Response:
See the responses to comments 1-2 and 1-8, above.

Comment Code 3-3
Response:
See the response to comment 1-1, above. Also, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-4
Response:
See the response to comments 1-3, 1-7, and 1-8, above.

Comment Code 3-5
Response:
See the response to comments 1-4 and 1-5, above.

Comment Code 3-6
Response:
See the response to comments 1-5, 1-6, and 1-9, above.

Comment Code 3-7
Response:
See the response to comment 1-7, above.

Comment Code 3-8
Response:
See the response to comment 1-8, above.

Comment Code 3-9
Response:
See the response to comment 1-9, above.

Comment Code 3-10
Response:
See Common Issue 2.1, Supplement Analysis Process, and Common Issue 2.2, Proposed Changes in Administrative Limits. Also, see the response to comments 1-1 and 1-19, above.

Comment Code 3-11
Response:
See Common Issue 2.3, Concerns With HEPA Filters, and Common Issue 2.2, Proposed Changes in Administrative Limits. Also, see the response to comments 1-1 and 1-19, above.

Comment Code 3-12
Response:
See the response to comments 1-15 and 1-16, above.

Comment Code 3-13
Response:
See the response to comments 1-15 and 1-16, above. Also, see Common Issue 2.3, Opposition to Nuclear Activities.

Comment Code 3-14
Response:

See the response to comment 1-15, above. The AVLIS project is not a driver for the increased limits; see also the response to comment 3-25, below.

Comment Code 3-15
Response:

See the response to comments 1-1 and 1-19, above. Also, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-16
Response:

DOE believes that the current rate of processing plutonium or uranium to their oxide forms at LLNL does not exceed the rates analyzed in the 1992 EIS/EIR.

Several programmatic operations at LLNL generate quantities of plutonium and uranium that are in the form of chips, fines, or thin layers deposited by vapor deposition. Programmatic operations that generate these materials are nuclear material machining and grinding operations, casting operations, and vapor deposition (AVLIS and other programs). Both uranium and plutonium in the form of finely divided dust or chips, or in the form of thin metal sheets are potentially pyrophoric and can spontaneously ignite and burn in the presence of air or oxygen. The pyrophoricity is highly dependent on the fineness of the material, surface condition, temperature, humidity and atmospheric composition. The equipment that generates these fines or sheets is usually enclosed in either a glovebox, hood or vacuum chamber from which air or oxygen is (usually) excluded. Once generated, potentially pyrophoric fines or other metal forms are expeditiously transported in closed containers or enclosures to designated workstations (hoods or gloveboxes depending on the material and quantity) where they are oxidized. Finely divided quantities of fissile material (plutonium or enriched uranium) are oxidized in small batch sizes due to criticality safety requirements. The oxidation process is always carried out in a manner designed to minimize dispersal of the material. In the case of plutonium, the oxidation is usually carried out in small furnaces. Once oxidation is complete, the material is in a very stable chemical form and can then be packaged for storage or other disposition depending on the nature and value of the material. In all cases, the oxidation processes for these metals are carried out in enclosures equipped with redundant HEPA filtration to prevent any dispersal of material to the environment. In addition, care is taken to minimize the handling or any other step that would lead to dispersal of the material within the enclosures. Since long-term storage of pyrophoric, unoxidized fines would create a significantly greater hazard than the above oxidation process, oxidation is routinely used to render any potentially pyrophoric uranium or plutonium safe for storage, transport, or other disposition.

Plutonium and uranium in liquid solution are also converted to oxide when the value of the material or disposition pathway requires it. This is typically accomplished though precipitation of the material from solution, filtration, and then furnace oxidation.

In addition to the oxidation of programmatically generated plutonium or uranium fines, LLNL is also processing material in storage to meet the requirements of the DNFSB's Recommendation 94-1.

See also the response to comment 3-51, below.

Comment Code 3-17
Response:

See the response to comment 3-16, above.

Comment Code 3-18
Response:

See Common Issue 2.4, Concerns With HEPA Filters. See also the response to comments 1-5 and 1-11, above.

Comment Code 3-19
Response:

DOE and LLNL will continue to manage wastes in accordance with the RODs (RODs have not yet been issued for LLW and LLMW) for the Waste Management Programmatic Environmental Impact Statement (WM PEIS) (DOE/EIS-0200-F) and the 1992 EIS/EIR. As discussed in Section 7 of this SA, LLNL has implemented a transuranic waste certification program to ensure that transuranic waste generated and packaged by LLNL can be certified for acceptance by WIPP. Transuranic waste will continue to be stored at LLNL until WIPP opens or another disposal option is identified by DOE.

Comment Code 3-20
Response:

See the response to comment 1-12, above.

Comment Code 3-21
Response:

DOE disagrees that the Plutonium Facility was shut down as a result of a recommendation by the DNFSB. In July1997, LLNL placed Building 332 into "Standby Mode" under which programmatic operations (machining, processing, etc.) with fissile, radioactive, or hazardous materials were suspended while transfer, handling, sampling and/or storage of the materials were

allowed. Stringent compensatory measures (e.g., increased oversight and review of all activities) were imposed on any work to be performed. By October 1997, all activities associated with materials transfer were under close scrutiny; senior management approval was required before such activities could be conducted.

In February 1998, a resumption plan was developed by LLNL with concurrence by the DOE/OAK and input from the DNFSB. Upon approval of this process, Building 332 started preparation of the resumption activities. LLNL completed resumption activities by February 1999. In March 1999, the final phase of the resumption process is under review by a team of LLNL and DOE/OAK staff. Based on the assessment and recommendations from this team, LLNL senior management, with DOE/OAK concurrence, will determine whether Building 332 will resume normal operations.

Also, see the response to comments 1-5 and 1-11, above.

Comment Code 3-22
Response:

See the response to comment 1-15, above.

Comment Code 3-23
Response:

See the response to comment 3-60, below.

Comment Code 3-24
Response:

The cumulative impacts of continuing to operate LLNL and SNL-L are presented in section 9 of the SA, including the impacts of the proposed projects through 2002. Section 9 was revised to update water and electrical usage, and airborne radionuclide emissions. Based on the level of emissions of existing and planned facilities and proposals, the impacts from these operations would be below limits and guidelines and within the envelope of the 1992 EIS/EIR, and are not considered significant.

Comment Code 3-25
Response:

The AVLIS program is proceeding as planned. The scope of current work for the LLNL operation of the AVLIS project is covered by the Environmental Assessment (EA) for the AVLIS IPD, USEC/EA-96001, January 1996. This document was finalized by the U.S. Enrichment Corporation (USEC) in January 1996, under an interagency cooperative agreement that

designated USEC as the lead agency and DOE as the cooperating agency for all environmental reviews at the LLNL site.

Based on the analyses in the EA, both USEC and DOE determined that the IPD scope of work was not a major action significantly affecting the quality of the human environment, and that preparation of an Environmental Impact Statement was not required. USEC and DOE jointly issued a Finding of No Significant Impact (FONSI) for the AVLIS IPD. Copies of the EA and FONSI were transmitted to all appropriate regulatory agencies and to the Western States Legal Foundation and other interested parties.

The AVLIS project is in the process of conducting the IPD phase. These demonstrations are planned to be completed by the year 2000. After IPD, AVLIS uranium operations through 2002 would continue within the scope of existing NEPA documentation. Any future AVLIS work at LLNL that is outside of the scope of the January 1996 USEC EA or the 1992 EIS/EIR would be subject to additional NEPA reviews.

A copy of the Terascale Simulation Facility (TSF) Conceptual Design Report has been placed in the LLNL public reading room for review. The potential impacts of construction and operation of the TSF at LLNL are being analyzed in an EA currently being prepared. Preliminary projections of water and electrical energy usage are included in section 2.10 and section 9 of the SA.

See also the response to comment 1-15, above.

Comment Code 3-26
Response:

See the response to comments 1-1, 1-11, and 1-18, above.

Comment Code 3-27
Response:

The 1992 EIS/EIR was issued when DOE was considering reconfiguration of the nuclear weapons complex; thus, Chapter 1 of the EIS/EIR acknowledged that potential changes in missions and activities resulting from this reconfiguration would be reviewed against the EIS/EIR. Since the issuance of the 1992 EIS/EIR, DOE has prepared the SSM PEIS, addressing the downsizing of the nuclear weapons complex. The SSM PEIS addressed the impacts of proposed actions on various DOE sites, including LLNL. Appendices to the SSM PEIS include specific NEPA analyses of two such long-term projects that were proposed for LLNL: the Contained Firing Facility and NIF.

This SA has systematically reviewed the ongoing and projected activities at LLNL through the year 2002 to identify significant changes from the 1992 EIS/EIR. This process of identifying

changes is described in Section 1.4 of the SA. The key projects identified in this process were evaluated to see if their impacts were outside the envelope of consequences established in the 1992 EIS/EIR, and whether, if exceeded, these impacts were significant. The remainder of the SA presents the results of that evaluation. As a result of this review, DOE has concluded that no supplementation of the 1992 EIS/EIR is required. As other new projects are proposed in the future, their potential impacts will also be evaluated against the analyses and bounding impacts outlined in the 1992 EIS/EIR and, if necessary, separate NEPA reviews will be undertaken.

Also, see Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-28
Response:

See the response to comment 3-27, above. Also, see Common Issue 2.3, Opposition to Nuclear Activities.

Comment Code 3-29
Response:

The NIF was evaluated in the 1992 EIS/EIR in the Proposed Action and Alternatives (section 3.0). Appendix A of the 1992 EIS/EIR discussed the proposed project and discussed risks to workers and the public from routine radiological operations and waste generation. Additionally, the SSM PEIS Project Specific Analysis for the NIF, Appendix I, SSM PEIS, September 1996, DOE/EIS-0236, evaluated the siting, construction and operation of the NIF. As indicated in Appendix I, "The purpose of this project-specific analysis is to assess the environmental impacts of construction and operation of NIF. This document describes the project and its purpose and need, considers site alternatives and project design options, delineates the affected environments, assesses potential environmental impacts, and suggests mitigation measures."

As a result of the Memorandum Opinion and Order on Count II of the Second Amended Complaint issued by the U.S. District Court for the District of Columbia under Civil Action No 97-0936 (NRDC v. Peña), DOE is required, no later than January 1, 2004, (1) to determine whether any or all experiments using plutonium, other fissile materials, fissionable materials other than depleted uranium, lithium hydride, or a Neutron Multiplying assembly, shall be conducted in the NIF; or (2) prepare a Supplemental SSM PEIS, in accordance with DOE NEPA Regulation 10 CFR 1021.314, analyzing the reasonably foreseeable environmental impacts of such experiments.

Comment Code 3-30
Response:

The United States, consistent with Article VI of the Nuclear Nonproliferation Treaty, is continuing negotiations on the elimination of nuclear weapons. The U.S. Senate voted to give its

advice and consent to ratification of the START II, which awaits action by the Russian Duma and the Federation Council to enter into force. In 1997, the President and President Yeltsin reached an understanding to begin negotiations on START III immediately after START II enters into force.

Meanwhile, however, a credible nuclear deterrent remains a cornerstone of U.S. national security policy. In President Clinton's September 22, 1997 letter transmitting the CTBT to the Senate for its advice and consent to ratification, he reiterated that "I consider the maintenance of a safe and reliable nuclear stockpile to be a supreme national interest of the United States."

LLNL performs activities in support of DOE's national security mission, which is assigned to DOE through Presidential Decision Directives and congressional actions. As required in10 CFR 1021.330(d), the SA addresses the adequacy of the 1992 EIS/EIR for ongoing and projected activities through the year 2002. These activities reflect the current mission assignments to LLNL; Section 1.4 of the SA describes the process that DOE used to identify these activities and evaluate changes from the 1992 EIS/EIR. It is not reasonable for the SA to consider alternatives that are inconsistent with current national security policy.

Also, see Common Issue 2.3, Opposition to Nuclear Activities, and Common Issue 2.1, Supplement Analysis Process.

Comment Code 3-31
Response:

LLNL has published data on the distribution of plutonium in the local environment. These data come from the comprehensive environmental monitoring program where all potentially affected environmental media are monitored for plutonium, including air, water, soils, and individual facility potential emission points. The data are published each year in the SAER. In addition, LLNL conducts computer dispersion modeling, based on both actual and potential emissions and actual meteorological data collected from our on-site meteorological tower.

See also the response to comments 1-5 and 1-12, above, and Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-32
Response:

The public dose from normal operations of LLNL and SNL-L, as well as the public dose from potential accidents evaluated in this SA take into account the densely populated area surrounding LLNL and SNL-L.

Very low levels of plutonium have been found in at least one area offsite. The plutonium is part of the legacy of past operations of LLNL. Practices that might have resulted in past

plutonium releases to offsite areas are no longer allowed today. Cleanup of plutonium involves remediation activities and consultation with appropriate authorities under CERCLA.

Also, see Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-33
Response:

See the response to comment 3-19, above.

Comment Code 3-34
Response:

DOE believes that continued operation of LLNL and SNL-L is within the impacts analyzed in the 1992 EIS/EIR and is consistent with the analyses present in the SSM PEIS, WM PEIS, and other NEPA documents.

Comment Code 3-35
Response:

The water use for TSF at LLNL is not as high as that projected for the Los Alamos National Laboratory. The total water use for LLNL in 2002, counting all users including NIF, is approximately the same amount projected for the year 2002 in the 1992 EIS/EIR. This projected amount can be provided with the current infrastructure and supply. Section 9 of the SA was revised to include the most recent cumulative water use projections for the TSF at LLNL.

Comment Code 3-36
Response:

The electrical use, including NIF and part of TSF, is expected to increase beyond levels originally projected in the 1992 EIS/EIR, but these increases would not have significant impacts since infrastructure and suppliers currently have the capacity to handle the projected use and peak load.

Comment Code 3-37
Response:

Now that the U.S. Enrichment Corporation has been privatized, DOE is responsible for NEPA reviews for new, future AVLIS operations at LLNL. However, the most recent NEPA document, Environmental Assessment for the AVLIS Integrated Process Demonstration, USEC/EA-96001, was completed by the USEC in January 1996. This EA was prepared under an interagency cooperative agreement that designated USEC as the lead agency and DOE as the cooperating agency. A FONSI was signed by USEC and DOE on January 3, 1996. As indicated in

the FONSI, "On the basis of the analysis in the EA, the Proposed Action to conduct the Integrated Process Demonstration at LLNL would not constitute a major action significantly affecting the quality of the human environment. Therefore, an Environmental Impact Statement is not required." Copies of these documents were provided to the public for review and comment during the review process.

Also, see the response to comment 3-25, above.

Comment Code 3-38

Response:

The MOX Lead Test Assembly work is currently being considered for implementation at LLNL in the Surplus Plutonium Disposition EIS. The MOX R&D work would require natural or depleted uranium which would be brought into Building 332, but would also be shipped out as work is incrementally completed, so that only an additional approximately 1000 kg would remain onsite after Fiscal Year 2003. This work would remain well within the proposed 3000 kg administrative limit for natural or depleted uranium for Building 332. The MOX program is expected to generate small quantities of transuranic waste (such as transuranic-contaminated glovebox gloves, bags, empty bottles, analytical waste, etc.) and LLW (such as wipes, gloves/shoe covers, decontamination wastewater, etc.). These wastes are not expected to significantly increase the waste streams at LLNL. The accident risk from performing the R&D activities of the MOX program will be within the envelope of accident impacts outlined within the 1992 EIS/EIR and this SA.

Comment Code 3-39

Response:

The program drivers for the higher tritium inventory limit are the Army Tritium Recovery/Recycle Project, Mound Tritium D&D support, and NIF target development and loading capability. The Army recycle work involves accepting shipments containing several grams (5 - 10 grams) of tritium, followed by a processing period, then transfer offsite. This sequence will occur repeatedly, occasionally with new shipments arriving before shipment of previous accumulations. An inventory of up to 20 grams could occasionally develop as a result of this activity, but only for the next 2 - 3 years when the Army change-out of tritium illumination devices will be the most intense. In assisting the Mound site with ongoing D&D activities it may become necessary to accept (and process for recycle) tritium storage vessels, beds or traps. The shipments could contain as much as 5 grams. Finally, the NIF developmental target work will require an inventory of several (2 - 5) grams. Follow-on installation of a target loading station will add an additional 5 grams or more to the maximum inventory requirement, but not for 3 - 4 years. The combined tritium requirements of these programs shows that a 30 grams inventory limit is appropriate and would provide sufficient flexibility if carefully managed.

Comment Code 3-40
Response:

A biohazard level III facility is not currently planned for LLNL. Nevertheless, if programmatic needs change, appropriate NEPA and safety reviews would be undertaken before such a facility is established at LLNL.

Comment Code 3-41
Response:
There are no classified annexes to the 1992 EIS/EIR or the SA.

Comment Code 3-42
Response:

Natural and depleted uranium consist of several isotopes, each with its own specific activity and very long half-life. The dominant isotope is U-238 (99.3%). The U-235 isotope decays about 6 times faster than U-238. Uranium with an increased proportion of U-235 (enriched) is used in reactor fuels and weapons. All uranium is toxic, as well as radioactive, although at a low level compared to many other radionuclides. The real difference in the isotopes of uranium is the ability of U-235 to fission.

DOE and LLNL make every effort to produce fact sheets and disseminate information to the public and media that is accurate.

Comment Code 3-43
Response:

See Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-44
Response:

See Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-45
Response:

See Common Issue 2.2, Proposed Changes in Administrative Limits.

Comment Code 3-46
Response:

DOE agrees an analysis is necessary to support the need for increased administrative limits for operations proposed in the Superblock Complex. The SA explains the results of such analyses but relies on the supporting documentation contained in SARs.

Nuclear SARs are prepared in accordance with DOE Order 5480.23. Contractors who are responsible for the design, construction, or operation of DOE nuclear facilities are required to perform safety analysis that develops and evaluates the adequacy of the safety basis for each such facility. The safety basis to be analyzed includes management, design, construction, operation and engineering characteristics necessary to protect the public, workers, and the environment from the safety and health hazards posed by the nuclear facility.

SARs have been prepared for all the nuclear facilities contained within the Superblock Complex and for the Nondestructive Test Facility, Building 239. These documents contain the analyses that support continued safe operations within the facilities.

Comment Code 3-47
Response:

The environmental justice section of the SA (section 8) has been revised to include Site 300. This site is located in a census block that is greater than the state average for minorities, but not for low income. Because impacts at Site 300 are within the bounds of 1992 EIS/EIR and are considered low or negligible, there would be no disproportionately high and adverse impacts near Site 300. The tritium-contaminated groundwater plume is within the site boundary and is receding due to ongoing remediation activities. This plume is not expected to affect offsite water users. See also the response to comment 1-7, above.

Comment Code 3-48
Response:

DOE provides information in English about Site 300 to interested stakeholders. However, no information is prepared in Spanish at this time.

Comment Code 3-49
Response:

Mitigation measures consisted of alerting LLNL programs of exclusion zones around each nest site until the young had fledged and were independent. These mitigation measures were developed in conjunction with the U.S. Fish and Wildlife Service. There has been a steady increase in nesting activity at the Livermore Site over the last 4 years. In 1998, 6 nesting pairs of kites were successful in fledging 14 young. Additional information is provided in the LLNL SAERs.

Comment Code 3-50
Response:

See Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 3-51
Response:

DOE proposes that the existing administrative limit of 700 kg for plutonium at Buildings 332 and 334 be retained, primarily to accommodate the plutonium already on site, which cannot be relocated to other DOE facilities, as described in section 1.4.2 of the SA. There are various physical and chemical forms in the laboratory, as expected in a research environment. In 1994 several cans containing plutonium ash residue (oxides) were found to be bulging. This resulted from internal pressure from gases slowly created by the plutonium irradiating organic materials (such as plastic bags) also in the sealed cans. This pressurization would not cause them to explode, but rather was of concern because a sudden release of pressure could have caused a puff of airborne particles. Nonetheless, building confinement filters would have prevented an environmental release. The cans were punctured to release any pressure, and they were over-packed in cans having a carbon frit-filtered vent. A program is underway to stabilize this plutonium residue so that it can be stored in sealed containers for many decades.

Comment Code 3-52
Response:

See the response to comment 3-25, above.

Comment Code 3-53
Response:

See the response to comment 3-25, above.

Comment Code 3-54
Response:

The cumulative impacts for site operations from 1998 to 2002 are addressed in Section 9 of this SA.

See also the response to comment 3-24, above.

Comment Code 3-55
Response:

The issue of water use by the site has been added to Section 9 on cumulative impacts, section 2.10 and section 9. Recent investigations on the effects of buried capacitors on groundwater are discussed in Section 2.4.

See Common Issue 2.1, Supplement Analysis Process. See also the response to comments 1-7 and 3-24, above.

Comment Code 3-56
Response:

LLNL work to support the subcritical testing program involves routine operations that are within the scope of its continuing mission activities as assessed in the 1992 EIS/EIR.

Comment Code 3-57
Response:

Current AVLIS activities were evaluated in Chapter 4 of the 1996 USEC EA. It was indicated that there would be releases to the environment from AVLIS operations. However, as indicated in the EA, programs have been established to minimize the amount of hazardous materials released to the environment. Regular monitoring is done as required under the Bay Area Air Quality Management District and the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations. Data are reported annually in LLNL's NESHAP report to the EPA. The AVLIS emissions are expected to be well below the threshold levels and are within conditions specified in permits.

See also the response to comment 3-25, above.

Comment Code 3-58
Response:

The AVLIS operations have been, and will continue to be, within the envelope described in the 1996 USEC EA, the 1990 DOE AVLIS EA, and the 1992 EIS/EIR.

See also the responses to comments 3-25 and 3-56, above.

Comment Code 3-59
Response:

See also the response to comment 3-29, above.

Comment Code 3-60
Response:

DOE does not believe that the level of tritium in the grapes in the local area have significantly higher levels of tritium than those used for wines in the Livermore Valley. The nature of atmospheric dispersion is such that higher concentrations are expected closer to the release point. However, four times a small number is still a small number, and it does not correlate to potential health impacts.

The information on tritium in Livermore Valley wine is discussed in the 1992 EIS/EIR. The amounts of tritium in wine are determined using highly sophisticated technology (helium-3 mass spectrometry). Such a sensitive technique allows one to detect differences between Livermore wines and others, but use of commercially available techniques would likely not be able to detect tritium in any samples, including those from Livermore. The tritium-in-wine data are published and placed in proper context each year in the SAER. That is, the data are evaluated using accepted and conservative dose models that indicate that while Livermore Valley wines do indeed contain more tritium than wines from other areas, the impacts are negligible. The dose to a consumer, assuming a relatively high 2-liter-per-day wine consumption at the highest tritium level detected in Livermore wines during 1997, would have been 0.0099 mrem. This dose is very small in comparison with the 10 mrem per year public exposure limit mandated in EPA regulations for the air pathway. That 10 mrem is conservative relative to the 100 mrem recognized internationally as providing adequate public protection from all pathways. And it is low compared to other radiological doses to persons in the vicinity of LLNL, including doses from naturally occurring radon, uranium, medical x-rays, cosmic rays, etc.

It is generally true that when tritium usage at LLNL is reduced, there are fewer operational emissions, and therefore smaller amounts detected in the environment. However, attempts to mathematically correlate annual tritium emissions with the measured concentrations of tritium in Livermore Valley wines have been unsuccessful. Although tritium rapidly diffuses in air and slowly permeates through most materials, the conversion rate of elemental gaseous tritium to a water form is relatively slow. Canadian field experiments show that the atmospheric conversion is on the order of 0.5% to 1% per hour (article by R. M. Brown, et al, in Health Physics 58:171-181, 1990).

While it is true that nearly a million curies of tritium have been released from LLNL over its history, it should be noted that over 700,000 of these curies were released in two events (1965 and 1970) in the form of elemental tritium gas. Tritium gas is known to have a significantly lower dose impact than tritiated water or water vapor; in fact, the dose is 25,000 times lower from exposure to tritium gas. Much of the remainder of the releases (about 50%) were also tritium gas releases. Therefore, the dose consequences of most of the tritium releases from LLNL have been negligible. In addition, LLNL's environmental monitoring program measures tritium impacts in all affected environmental media and reports those data annually in the SAER.

The potential for tritium to be released from routine NIF operations has been assessed in its project-specific environmental analysis at Appendix I of the DOE SSM PEIS. The amount of

incremental tritium emissions from NIF will be much smaller than present emissions from the Laboratory, and thus have no additional environmental or public health effect. Continuous stack monitoring will be installed at NIF.

See also, the response to comment 3-29, above.

Comment Code 3-61
Response:

See the response to comment 3-29, above.

Comment Code 3-62
Response:

The intent of the programmatic environmental document (such as the 1992 EIS/EIR) is to provide an impact analysis baseline that bounds the impacts from ongoing and future proposed projects. Most of the larger new facilities at LLNL that have been completed, are underway, or are proposed for construction by year 2002 were mentioned as proposed projects in the1992 EIS/EIR. Although these facilities were mentioned as proposed projects, their specific, detailed design and process information were not available to conduct an environmental analysis at the time of completion of the 1992 EIS/EIR. As their design information became available, project-specific NEPA analyses were completed as committed in the 1992 EIS/EIR. The potential impacts of those new project-specific NEPA analyses (as noted in Table 1.1 of the SA) were compared with the bounding accident impact projections contained in the programmatic 1992 EIS/EIR. Completion of these projects should yield no significant unmitigated environmental effects and the 1992 EIS/EIR still remains adequate.

Comment Code 3-63
Response:

The probability of one in one million per year is a generally accepted cut-off point used in determining when an event is considered credible (i.e., higher than one in one million per year) and subject to analysis, or is considered incredible (i.e., less than one in one million per year) and typically not analyzed.

4.4 RESPONSES TO COMMENTS FROM DOCUMENT 4: PUBLIC BRIEFING, LIVERMORE, FEBRUARY 11, 1999, 6:00 P.M.

Comment Code 4-1
Response:

Eighty tons of uranium is required for the AVLIS IPD series work outlined in the 1996 USEC EA. This quantity was also the administrative limit for the facility that was analyzed in the 1992 EIS/EIR.

Comment Code 4-2
Response:

See the response to comment 1-15, above.

Comment Code 4-3
Response:

DOE, in its NEPA reviews, must consider sites that are reasonable alternatives to perform the proposed action or work. Typically, only a few sites, such as LLNL, have the infrastructure and technical expertise to carry out the proposed work. DOE selects sites based on the lack of significant environmental impacts, as well as other factors such as costs, availability of facilities, technical expertise, etc.

Also, see Common Issue 2.3, Opposition to Nuclear Activities, and Common Issue 2.4, Concern with HEPA Filters.

Comment Code 4-4
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-5
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-6
Response:

See Common Issue 2.1, Supplement Analysis Process, and Common Issue 2.3, Opposition to Nuclear Activities.

Comment Code 4-7
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-8
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-9
Response:

See Common Issue 2.3, Opposition to Nuclear Activities. Also, see the response to comment 4-3, above.

Comment Code 4-10
Response:

This SA evaluates the increase in uranium limit for Buildings 332 and 334 from 300 kg (all types) to 3,500 kg (all types). Uranium is very dense (specific gravity about 19). About 7 cubic feet of uranium metals would weigh about 3200 kg. This is larger than a basketball: about the size of a microwave oven. Less than 1% enriched uranium metal is not highly radioactive and is used in a number of applications such as boat ballast, counterweights, and shielding for tanks and other military vehicles. See also the response to comment 1-15, above.

Also, see Common Issue 2.2, Proposed Changes in Administrative Limits.

Comment Code 4-11
Response:

The increased quantities of uranium would be stored locally at LLNL.

Comment Code 4-12
Response:

DOE analyzes all possible accident scenarios and screens out those considered incredible. For the vault, the series of events have a combined probability so low that it is considered incredible, that is, has a chance of less than one in one million per year of operations. In the case of the vault, the materials are in a sealed hardened source designed to withstand extreme events, such as a ground acceleration greater than 0.8g. There is no combustible material in the vault to feed a fire, and the vault is for all purposes impenetrable to external challenges. As a result of this, for a variety of scenarios, the probability of the material being released is calculated to be less than one in one million per year of operation. The possibility that an accident could release material from the vault to the environment is considered an incredible event or extremely improbable.

Comment Code 4-13
Response:

LLNL conducts a comprehensive environmental monitoring program that samples all parts of the environment to determine the impacts of LLNL operations on the environment and the public. The program includes direct monitoring of both Laboratory emissions (stacks and sewer) as well as surveillance monitoring of the environment surrounding the Laboratory. State-of-the-art monitoring equipment and analytical techniques are used to measure concentrations of potential pollutants at extremely low levels. The program has been evaluated by qualified peers and found be extremely robust and comparable to any in the country or world. The results of the environmental monitoring program are published every year in the SAER.

See the response to comments 1-2, 1-4, 1-7, 1-12, 3-31, and 3-60. Also, see Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 4-14
Response:

DOE does not believe that the continued operation of LLNL and SNL-L will pose a significant impact to the public or the environment.

See the response to comments 1-2, 1-3, 1-4, 1-5, 1-7, 1-8, and 1-12. Also, see Common Issue 2.4, Concerns With HEPA Filters.

Comment Code 4-15
Response:

See the response to comment 4-3, above. Also, see Common Issue 2.3, Opposition to Nuclear Activities, above.

Comment Code 4-16
Response:

The units have been changed to be consistent; the correct unit is one chance in one million per year. DOE has decided to continue the use of curies in the SA and not include the equivalent units in becquerels or disintegrations per second for ease of presentation.

Comment Code 4-17
Response:

See Common Issue 2.1 Supplement Analysis Process.

Comment Code 4-18
Response:

DOE has several programs for reporting incidents and accidents. The CAIRS system collects the widest range of data. CAIRS is a database used to collect and analyze DOE and DOE contractor reports of injuries, illnesses, and other accidents that occur during DOE operations in accordance with DOE Order 231.1. CAIRS reporting is managed by the Office of Occupational Safety & Health Policy (EH-51). Access to the CAIRS system is available through the internet at "www.tis.eh.doe.gov."

Another level of reporting is covered under the Occurrence Reporting and Processing System (ORPS). DOE's ORPS Program provides timely notification to the DOE complex of events that could adversely affect: public or DOE worker health and safety, the environment, national security, DOE's safeguards and security interests, functioning of DOE facilities, etc. DOE analyzes aggregate occurrence information for general implications and operational improvements. The ORPS Program and its data system are described in DOE Order 232.1A and its associated Manual, DOE Manual 232.1-1A. DOE/OAK final occurrence reports are available to the public through the Energy Information Center or the Office of Public Affairs located at 1301 Clay Street, Oakland, California. These offices can be contacted for any information pertaining to injuries, illnesses or accidents involving LLNL.

Significant occurrences or accidents are analyzed in investigations termed Type "A" and Type "B". A report is done on each of these accidents and is available to the public through the internet at "www.tis.eh.doe.gov." Specific information pertaining to DOE/OAK accidents is available through the Energy Information Center or the Office of Public Affairs.

DOE is not aware of any releases or spills to the environment associated with a 5.5 earthquake in the recent past. There was a 5.5 seismic event in 1980 at Livermore. Several upgrades were made to the Laboratory's infrastructure as a result of that event. The analysis in the 1992 EIS/EIR incorporates data and changes to facilities from the 1980 earthquake.

Comment Code 4-19
Response:

DOE and LLNL would report any accidents with the potential to impact the public or the environment, even if it occurred as a result of classified activities.

See also the response to comment 4-18, above.

Comment Code 4-20
Response:

See the response to comment 4-18, above.

Comment Code 4-21
Response:

The only criticality incident in the last four decades at LLNL occurred on March 26, 1963, in Building 261, during a criticality experiment. The occurrence of an excursion of 4×10^{17} fissions was attributed to mechanical failure during the experiment. Exposure to personnel in or near the building was low and did not exceed 0.12 rem. Only small amounts of short-lived gaseous fission products were released from the experiment room.

Comment Code 4-22
Response:

DOE acknowledges that nearly a million curies of tritium have been released from LLNL over its history. However, it should be noted that over 700,000 of these curies were released in two events (1965 and 1970) in the form of elemental tritium gas. Tritium gas is known to have a significantly lower dose impact than tritiated water or water vapor. In fact, the dose is 25,000 times lower from exposure to tritium gas. Much of the remainder of the releases (about 50%) were also tritium gas releases.

The tritium in vegetation consists of that in “free water” and that which is in an organic molecules. In the 1997 SAER, LLNL included a discussion of organically-bound tritium doses, assuming that entire plants were made up of organically-bound tritium, and showed that the doses were negligible. Although the potential damage to human tissue of an organically-bound tritium molecule may be a factor of 3 to 5 higher than for a molecule in free water form, this organic portion is so small that that it is not considered a significant contributing factor. In the calculations of public dose, the assumptions as to intake of vegetation are very conservative (overestimated) that they outweigh any organically-bound tritium that could be separately measured. The direct monitoring of organically-bound tritium is difficult and expensive, and would not enhance public protection.

Comment Code 4-23
Response:

See the response to comment 1-15, above.

Comment Code 4-24
Response:

The SA (Section 6) notes that the methodology for assessing accidents used in the 1992 EIS/EIR employed a consequence assessment and not a risk assessment methodology. Consequence assessment approaches assume that the triggering event (e.g., earthquake) and resulting release of hazardous material have a 100% probability of occurring. Consequences (e.g., dose, exposure, and health effects) are therefore calculated as if the event and release occurred. The frequency of handling or use of a material would not factor into an approach employing a consequence assessment.

The probability of an accident that releases material to the environment is related to a limited extent to the number of operations with the material. Accidents also occur as a result of hardware failure (e.g., valves, fans) and building fires and natural phenomena (e.g., earthquakes). These accidents are independent of the operations, and the amount released and their consequences depend greatly on the amount of "material at risk" to the accident. The amount at risk is controlled by administrative limits for the amount of material in a container, glovebox, workstation, room, etc. Because of this, neither the probability, size of the release, nor the consequences increase proportionally with the increased inventory in the facility. In the 1992 EIS/EIR, and therefore in this SA, the consequences of "bounding accidents" are presented. Although the administrative limits are proposed to be raised, the bounding accidents in the 1992 EIS/EIS have been found by this SA to still apply.

Comment Code 4-25
Response:

There was one air plutonium release from the Plutonium Facility at LLNL in 1980 as a result of an incorrect changeout and sealing of HEPA filters. The amount released was monitored at the time. Ongoing, continuous monitoring of the plutonium facility, using methods sanctioned by the US Environmental Protection Agency, indicates that the HEPA filter systems are performing as intended.

DOE believes that worker safety and health monitoring is within established guidelines for exiting radioactive areas.

Also, see Common Issue 2.4, Concerns With HEPA Filters, above.

Comment Code 4-26

Response:

There was a release of plutonium to the sanitary sewer in 1967 at LLNL. Both the amounts of plutonium released and the resulting concentrations in the sludge at the Livermore Water Reclamation Plant (LWRP) have been estimated and discussed in the SAERs and the 1992 EIS/EIR. Although knowledge about where the affected sludge was ultimately utilized is uncertain, experiments using the contaminated sludge to grow a vegetable garden were conducted and the results published in the early 1970s; these experiments indicated there was no cause for health concern from the plutonium in the sludge. Furthermore, gardens of Laboratory employees who received contaminated sludge from the LWRP were sampled and these data also indicate no cause for public health concern. It is likely that the same is true regardless where this material was used. The nature and magnitude of the contamination does not warrant any cause for public health concern.

Also, see the response to comment 1-12, above.